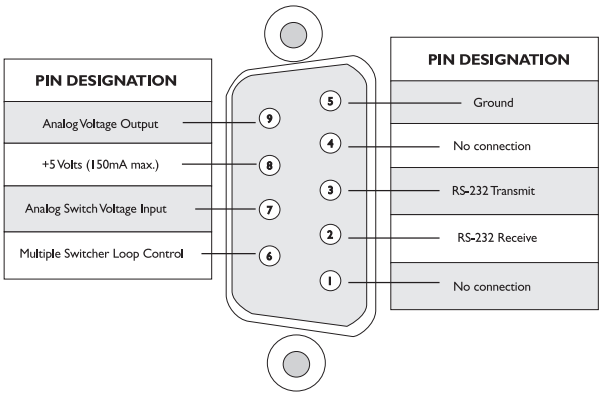
RS-232 Protocol and Pin-outs for the MX2216RM, MX2206RM, and MX2406RM Switchers

The above models all currently offer the same RS-232 control features, protocol, and interconnect methods. The following information is intended as a guideline to help you during your initial design and product selection stages. This is not intended as a comprehensive review of each model's capabilities. It is recommended that you confirm product specifications before finalizing any design and that you refer to the product's User's Guide during installation.



The MX--RM Series switchers all utilize a Female 9-pin D connector on their rear panels that allow access to a variety of control capabilities.
It is generally recommended to select a single method of control for each application, as the activation of several different controls simultaneously may cause unpredictable results.

The majority of control systems and computers used in presentation system applications make use of the RS-232 communications standard.

To connect an MX--RM Series switcher to a control system or computer for RS-232 control, only three pins are required on each port: Transmit (TX), Receive (RX), and Ground (GND). Always remember that the Transmit pin from the control system or computer must be connected to the Receive pin on the switcher control port; do not connect Transmit to Transmit or Receive to Receive. Following is a typical cable wiring pin-out:

PC COM Port (9-pin D) to MX—RM (9-pin D)

COM Port Pin #	MX—RM Pin #
2	3
3	2
5	5

Port setting preferences for the control system or computer being used to control the switcher should be set as follows:

BAUD Rate (Bits per second): 2400
Data bits: 8
Parity: ..... None
Stop Bits: 1

The MX22–RM Series and MX24–RM Series Switchers utilize a female 9-pin D Control Port Connector.

RS-232 Control

No software or hardware flow control is implemented. The RS-232 input has a 6-character buffer and will not execute additional commands until the previous command is fully processed.

RS-232 Protocol:

Command	Function
[INP0]	All Channels Off
[INP1]	Select Input 1
[INP2]	Select Input 2
[INP3]	Select Input 3
[INP4]	Select Input 4
[INP5]	Select Input 5
[INP6]	Select Input 6
[RSET]	Reset unit to user defaults
[VERN]	Returns firmware version number

Commands must be issued as shown, in ALL CAPS and with the brackets [ ] included in the command string. After processing a valid command, an [OK] string will be returned. On models # MX2206RM, and MX2416RM, the [OK] will also be followed by a command echo.

For instance, a command of [INP1] would return [OK][INP1]. The [VERN] command will return the corresponding software version being utilized by the switcher, such as [1.0]. If a command is not recognized, an error string, [ERR], will be returned.

If the control system being used is not set up to wait for the [OK] string, it is important to include a 100-millisecond delay between each command.

The MX--RM Series switchers are also designed to send Feedback commands from the switcher to the control system when the buttons on the front panel of the switcher are pressed.

The Feedback codes are as follows:

Key Pressed	Description	Feedback Code
1	Input Select	[INP1]
2	Input Select	[INP2]
3	Input Select	[INP3]
4	Input Select	[INP4]
5	Input Select	[INP5]
6	Input Select	[INP6]
Stand By	All Outputs Off	[INP0]
Reset	Reset	[RSET][INPx]

These feedback codes allow multiple MX--RM Series switchers to be connected in a Master-Slave configuration, if desired.

When the control ports of two units are connected as shown below, the Slave unit duplicates the actions of the Master unit. The slave unit can still be controlled from its front panel or through another RS-232 control.

Master-Slave Control Port Connection

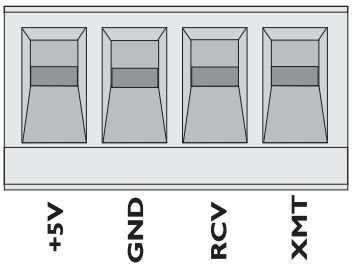
MX—RM Master Pin #.....MX—RM Slave Pin #
3.....2
5.....5

RS-232 Protocol and Pin-outs for the MX2226AT Switcher

The following information regarding RS-232 control of the MX2226AT Switcher is intended as a guideline to help you during your initial design and product selection stages.

This is not intended as a comprehensive review of each model's capabilities. It is recommended that you confirm product specifications before finalizing any design and that you refer to the product's User's Guide during installation.

The MX2226AT utilizes a terminal block type connector for RS-232 interconnection. The terminal block uses solder-free, screw-down contacts, making it extremely easy to connect the switcher to a control system or computer in the field.



The terminal block is labeled with the proper contact designations: Transmit (TX), Receive (RX), and Ground (GND). Always remember that the Transmit pin from the control system or computer must be connected to the Receive pin on the switcher control port; do not connect Transmit to Transmit or Receive to Receive. Note: the contact labeled "Loop" is not used for RS-232 connection. This feature is used when multiple switchers are connected together to create a larger switcher.

Typically, a control system or computer will offer RS-232 connection on a 9-pin D connector. Following is a typical cable pin-out designation for RS-232 connection. Always confirm the pin-outs for your system to insure proper wiring.

The MX2226AT Switcher utilizes a 4-pin Terminal Block type Control Port Connector.

PC COM Port (9-pin D) to MX2226AT (Terminal Block)

COM Port Pin #	MX2226AT Pin #
2	TX
3	RX
5	GND

RS-232 Control

Port setting preferences for the control system or computer being used to control the switcher should be set as follows:

BAUD Rate (Bits per second):	2400
Data bits:	8
Parity:	None
Stop Bits:	1

No software or hardware flow control is implemented. The RS-232 input has a 6-character buffer and will not execute additional commands until the previous command is fully processed.

RS-232 Protocol:

Command	Function
[INP0]	All Channels Off
[INP1]	Select Input 1
[INP2]	Select Input 2
[INP3]	Select Input 3
[INP4]	Select Input 4
[INP5]	Select Input 5
[INP6]	Select Input 6
[RSET]	Reset unit to user defaults
[VERN]	Returns firmware version number

Commands must be issued as shown, in ALL CAPS and with the brackets [ ] included in the command string.

After processing a valid command, an [OK] string will be returned, followed by a command echo. For instance, a command of [INP1] would return [OK][INP1]. The [VERN] command will return the corresponding software version being utilized by the switcher, such as [1.0].

If a command is not recognized, an error string, [ERR], will be returned.

If the control system being used is not set up to wait for the [OK] string, it is important to include a 100-millisecond delay between each command.

The MX2226AT switcher is also designed to send Feedback commands from the switcher to the control system when the buttons on the front panel of the switcher are pressed. The Feedback codes are as follows:

Key Pressed	Description	Feedback Code
1	Input Select	[INP1]
2	Input Select	[INP2]
3	Input Select	[INP3]
4	Input Select	[INP4]
5	Input Select	[INP5]
6	Input Select	[INP6]
Stand By	All Outputs Off	[INP0]
Reset	Reset	[RSET][INPx]

These feedback codes allow multiple MX2226AT switchers to be connected in a Master-Slave configuration, if desired.

When the control ports of two units are connected as shown here, the Slave unit duplicates the actions of the Master unit. The slave unit can still be controlled from its front panel or through another RS-232 control.

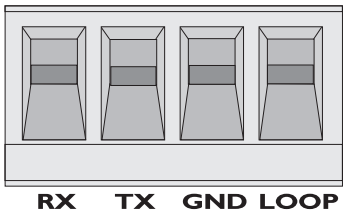
Master-Slave Control Port Connection

Master Pin #	Slave Pin #
TX	RX
GND	GND

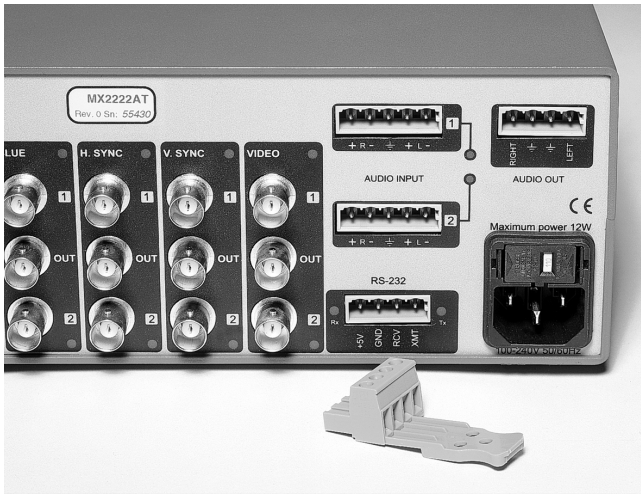
RS-232 Protocol and Pin-outs for the MX2222AT Multimedia Switcher

The MX2222AT switcher offers remote control capabilities via RS-232, the primary communications standard used by control systems and computers. In fact, the MX2222AT offers more features through use of RS-232 than are available currently from the front panel of the unit.

The MX2222AT offers a terminal block type connector for RS-232 interconnection. The terminal block uses solder-free, screw-down contacts, making it extremely easy to connect the switcher to a control system or computer in the field.



The terminal block is labeled with the proper contact designations: Transmit (XMT), Receive (RCV), and Ground (GND). Always remember that the Transmit pin from the control system or computer must be connected to the Receive pin on the switcher control port; do not connect Transmit to Transmit or Receive to Receive.



Note: the contact labeled "+5V" is not used for RS-232 connection. This contact is used for providing DC voltage to other equipment installed within close proximity of the MX2222AT.

Typically, a control system or computer will offer RS-232 connection on a 9-pin D connector. Following is a typical cable pin-out designation for RS-232 connection. Always confirm the pin-outs for your system to ensure proper wiring.

PC COM Port (9-pin D) to MX2222AT (Terminal Block)

COM Port Pin #	MX2222AT Pin #
2	XMT
3	RCV
5	GND

The MX2222AT has two LED's on either side of the control port terminal block connector. These LED's are used to determine that a proper connection has been made. If both LED's turn GREEN, the connection is correct.

Port setting preferences for the control system or computer being used to control the switcher should be set as follows:

BAUD Rate (Bits per second):	2400
Data bits:	8
Parity:	None
Stop Bits:	1

The MX2222AT Switcher utilizes a 4-pin Terminal Block type Control Port Connector.

RS-232 Control

No software or hardware flow control is implemented. The RS-232 input has a 6-character buffer and will not execute additional commands until the previous command is fully processed.

RS-232 Protocol:

The following commands are used to control the MX2222AT switcher. The commands must be issued as shown, in ALL CAPS and with the brackets [ ] included in the command string.

Command	Function
[VERN]	Returns the version number of the firmware followed by an [OK] command. Delay: 50 ms
[RSET]	Resets switcher to "power-on" state. Feedback code: [OK]. Delay: 500 ms
[FRSET]	Resets switcher to factory state. Memory is reset to factory default. Feedback code:[OK]. Delay: 2 seconds
[Ixnn]	Selects switcher input. Feedback code: [OK]. Delay: 200 ms

x – refers to Group to be switched. There are a total of 6 Groups available. Each Group can have up to 6 channels associated with it. (see below)

nn – refers to channel selected. This should be either 01 or 02. No other values are allowed.

When controlling the MX2222AT by RS-232, it will typically be preset in either its standard Factory Default Mode or in Independent Channel Switching Mode (these modes are preset during power-up of the unit).

In the Factory Default Mode, the Groups are set as follows: Group 1 - RGBHV, Group 2 -Video, Group 3 - Audio, Group 4 - User programmable, Group 5 - User programmable, Group 6 - User programmable

Examples of Input Selections in Factory Default Mode:

a) To switch RGBHV to Ch. 1 [I101]
b) To switch RGBHV + Audio to Ch. 2 [I102][I302]

In the Independent Channel Switching Mode, the Groups are set up as follows: Group 1 - Red, Group 2 -Green, Group 3 - Blue, Group 4 - Hor. Sync, Group 5 - Vert. Sync, Group 6 - Video

Examples of Input Selections in Independent Channel Switching Mode:

a) To switch Green to Ch. 2 [I202]

b) To switch H & V Sync to Ch. 1 [I401][I401]

Note: If the control system or computer being used to control the MX2222AT is not set up to wait for the [OK] string, it is important to include a delay between each command. Delay times are shown above for each of the commands.